REMARKS

Claims 7-20 are pending in the present application. In the Office Action, claims 7, 8, 10, 12-14, 16, and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over a combination of Van Liempd et al. (EP 0 0091 648), Maier et al. (FR 2,808,619) and Seiler et al. (US 4,178,619). Claims 9, 11, 15, 17, 18, and 20 were deemed unpatentable over that same combination and further in view of Saunders (US 4,633,362).

In this response, no amendments are made. A listing of claims is nevertheless provided for convenience.

Reconsideration of the application in view of the amendments and the following remarks is respectfully requested.

Rejections of claims 7, 8, 10, 12-14, 16, and 19 under 35 U.S.C. §103(a):

Claims 7, 8, 10, 12-14, 16, and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over a combination of Van Liempd et al. (EP 0 0091 648), Maier et al. (FR 2,808,619) and Seiler et al. (US 4,178,619).

Van Liempd et al. describes an energizer circuit for magnetic valves in metering devices that are excited by pulses. The goal is to achieve rapid opening and closing of the valve and, at the same time, lower power consumption and heat dissipation. The energizing coil L of the magnetic valve is connected via two switch paths T3, T5 in series initially to a higher voltage trigger current source U1 and after opening of the valve to a maintaining current source U2 at a lower voltage. The changeover takes place via a timer (R, C, T1) or via a sensor circuit sampling the position of the moving magnetic core.

Maier et al. describes an electronic operating mechanism for electromagnetic circuit switching having a voltage U_v applied across a coil 7 for a time 6 with a regulated current I. The voltage is provided by a rectifier 4 connected to a voltage sector U_n.

Seiler et al. describes a protective integrated circuit network to permit integration of a control circuit to switch an inductive load and to protect the integrated control circuit against inductive voltage kicks, voltage surges, and reverse polarity.

The invention described and claimed in the present application is directed to a control circuit for an electromagnetic operating mechanism that has an operating coil, a magnetic core and an armature. Independent claim 7 recites a control circuit for an electromagnetic operating mechanism that includes:

> a timer;
> a first electronic switching device including a voltage follower and including a first output connected in series with an operating coil of the electromagnetic operating mechanism, the first electronic switching device being configured to activate for a duration of a pickup phase of the electromagnetic operating mechanism after a control voltage has been applied via the timer;
> a second electronic switching device including a switching path connected in series with the operating coil, the second electronic switching device being turned on while the control voltage is present;
> a rectifier circuit connected to a control input, the rectifier circuit including a second output and being configured to supply a smoothed operating voltage at the second output;
> a step-down DC voltage converter connected downstream of the rectifier circuit, the step-down DC voltage converter including a third output and being configured to supply a smoothed holding voltage at the third output; and
> a voltage source controllable by the timer and configured to activate the first electronic switching device by a pickup voltage;
> wherein:
> the timer is activatable by a ramping up of the operating voltage;
> the operating coil and the switching path of the second electronic switching device form a series circuit connected to the first output;
> the series circuit and the first electronic switching device are suppliable with the operating voltage; and
> the third output, the first output, and a control input of the second electronic switching device are interconnected, the third output being interconnected via a forward biased isolation diode.

Applicants respectfully submit that the combination of Van Liempd et al. Maier et al. and Seiler et al. does not teach or suggest several features of independent claim 7. Specifically, there is no suggestion for the feature of a first electronic switching device including a voltage follower. Support for that feature is found in Applicants specification, for example at paragraphs [0015] and [0022] .

The Examiner asserts that the switch T5 of Liempd et al. provides a suggestion for this feature. See Office Action at page 2. However, Liempd et al. does not describe switch T5 (or any other component) as including any voltage follower function. Nor is there any reason to include a voltage follower in Liempd et al., because Liempd et al. describes separate sources for high voltage and low voltage current supplies (U1 and U2). In addition, the Examiner has not asserted that any of the other cited references suggests a first switching device that includes a voltage follower as recited in claim 7.

In addition, Applicants respectfully submit that the combination does not teach the feature of at least the feature of a third output (i.e. output of a voltage converter), first output (i.e. output of the first switching device) and the control input of the second switching device being interconnected. This three-way interconnection recited in claim 7 enables the advantages described in the applicants specification, for example energizing the coil with wither a pick-up voltage or a holding voltage in the manner described that are each derived from a single voltage source.

The Examiner admits that Liempd et al. does not suggest such a three way interconnection. In fact, Liempd et al. teaches that the output of the first switch T5 is prevented from reaching the control input of the second switch T3, and instead teaches that a separate voltage source U2 is connected to the control input of T3, depending on the status of switch T2. The Examiner relies on the teaching of Seiler et al. for disclosing a four-layer triode 28 "similar to the second switch of Liempd et al., i.e. positioned between the solenoid and the ground terminal". See Office Action at page 4-5. The Seiler four-layer triode 28, however, is not connected in series with the operating coil as recited in claim 7. Moreover, the control input of the Seiler triode 28 is not interconnected to an output of any component analogous to a "first switching device" recited in claim 7. Therefore, even modifying Liempd to include the triode 28 of Seiler et al. as suggested by the Examiner does not provide a suggestion for the three-way interconnection as recited in claim 7.

Nor does the reason to combine the references asserted by the Examiner lead to an interconnection suggested by the Examiner. The triode 28 of Seiler et al. is suggested merely as a means to protect the circuit from overvoltages. There is no suggestion in any of the references for a reason to modify Liempd from a two-way connection to a three way connection. Nor does Maier

provide any suggestion for such a three-way connection. Instead, Maier et al. teaches that the supply voltage to the coil is separated from the control input of the second switching device.

For at least the above reasons, therefore, withdrawal of the rejections to claims 7, 8, 10, 12-14, 16, and 19 under 35 U.S.C. §103(a) is respectfully requested.

Rejections of claims 8, 11, 15, 17, 18, and 20 under 35 U.S.C. §103(a):

Claims 9, 11, 15, 17, 18, and 20 were deemed unpatentable over that same combination and further in view of Saunders (US 4,633,362).

Applicants respectfully submit that Saunders does not cure the deficiency of the Van Liempd, Maier, and Seiler combination. Specifically, Saunders also fails to recite at least the interconnection and voltage follower features as recited in independent claim 7.

Withdrawal of the rejections to claims 8, 11, 15, 17, 18, and 20 under 35 U.S.C. § 103(a) is respectfully requested.

CONCLUSION

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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